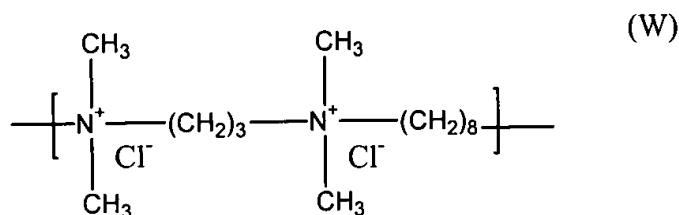




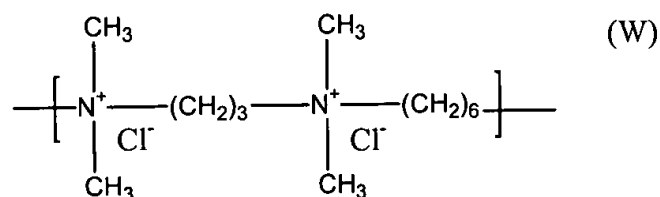
a patent. See C.F.R. § 1.221(b).

The mistakes, which are indicated in red ink on the relevant pages of the marked-up copy of the published application attached hereto, are as follows:

(A) Paragraph [0063], page 3, col. 2, formula (W) recites:



but should recite:



(B) Paragraph [0073], line 1, recites "(Vil)" but should recite "(VIII)".

(C) Paragraph [0077], line 1, recites "(Vil)" but should recite "(VIII)".

(D) Paragraph [0095], line 6, recites:

"2,5-dimethyl-para-phenylened iamine"

but should recite "2,5-dimethyl-para-phenylenediamine".

- (E) Paragraph [0095], lines 9-10, recite:  
"N,N-bis( $\beta$ -hydroxyethyl)-para-phenylened iamine"  
but should recite "N,N-bis( $\beta$ -hydroxyethyl)-para-phenylenediamine".
- (F) Paragraph [0095], lines 14-15, recite:  
"N-( $\beta$ -hydroxypropyl)-para-phenylened iamine"  
but should recite "N-( $\beta$ -hydroxypropyl)-para-phenylenediamine".
- (G) Paragraph [0096], lines 5-6, recite:  
"2- $\beta$ -hydroxyethyloxy-para-phenylened iamine"  
but should recite "2- $\beta$ -hydroxyethyloxy-para-phenylenediamine".
- (H) Claim 55, page 17, col. 1, line 20, recites:  
"(Vil)" but should recite "(VIII)".
- (I) Claim 55, page 17, col. 1, line 20, recites:  
"(Vil)" but should recite "(VIII)".
- (J) Claim 58, page 18, col. 1, line 2, recites:  
"(Vil)" but should recite "(VIII)".

- (K) Claim 61, page 18, col. 2, line 30, recites:  
“(Vil)” but should recite “(VIII)”.
- (L) Claim 64, page 19, col. 2, line 2, recites:  
“(VII)” but should recite “(VIII)”.
- (M) Claim 64, page 19, col. 2, line 6, recites:  
“—(CH<sub>2</sub>)<sup>r</sup>—CO—” but should recite “—(CH<sub>2</sub>)<sub>r</sub>—CO—”.
- (N) Claim 74, page 20, col. 1, last line, recites:  
“(VII)” but should recite “(VIII)”.
- (O) Claim 77, page 21, col. 1, line 21, recites:  
“(VII)” but should recite “(VIII)”.
- (P) Claim 83, page 22, col. 2, line 10, recites:  
“—(CH<sub>2</sub>)<sup>r</sup>—CO—” but should recite “—(CH<sub>2</sub>)<sub>r</sub>—CO—”.

For at least the foregoing reasons, Applicants request that the Office  
correct the above-identified mistakes in the published application, which were the

Customer No. 22,852  
Application No. 09/750,717  
Attorney Docket No. 05725.0826-00

fault of the Office. Further, Applicants request that the Office forward to Applicants a copy of the corrected published application or at least a notification of the occurrence or predicted occurrence of the corrected publication once it has been corrected.

Applicants believe that no Petition or fee is due in connection with this Request. However, if any Petition or fee is due, please grant the Petition and charge the fee to our Deposit Account No. 06-0916.

Respectfully submitted,

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By: 

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Registration No. 45,644

Date: March 21, 2002

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to 22 carbon atoms, such as from 1 to 4 carbon atoms, hydroxyalkyl groups, such as hydroxy alkyl groups wherein the alkyl radical comprises from 1 to 5 carbon atoms, and C<sub>1</sub>-C<sub>4</sub> amidoalkyl groups;

[0052] R<sub>10</sub> and R<sub>11</sub>, together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group, such as piperidyl groups and morpholinyl groups;

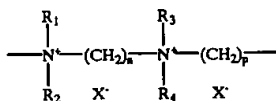
[0053] Y<sup>-</sup> is an anion, such as bromide, chloride, acetate, borate, citrate, tartrate, bisulfate, bisulfite, sulfate and phosphate. For example, such polymers are described in French patent 2,080,759 and in its Certificate of Addition 2,190,406, the disclosures of which are incorporated herein by reference.

[0054] One embodiment of the invention employs the polymer of formula (VI) for which R<sub>12</sub> is hydrogen, R<sub>10</sub> and R<sub>11</sub> are methyl groups, and having a molecular mass, measured by Carbon-13 NMR of about 100,000.

[0055] Non-limiting examples of the polymers defined above include the dimethyldiallyl-ammonium chloride homopolymer sold under the name "MERQUAT 100" by the company Calgon (and its homologues of low weight-average molecular mass).

[0056] The at least one other particular quaternary polyammonium polymer according to the invention can be chosen from:

[0057] (i) polymers comprising repeating units of formula (a):



[0058] wherein:

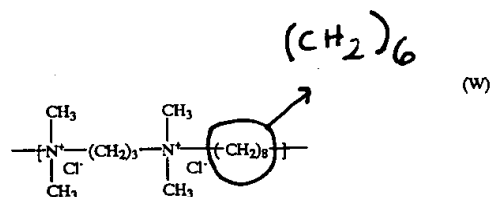
[0059] R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

[0060] n and p, which may be identical or different, are each chosen from integers ranging from 2 to 20; and

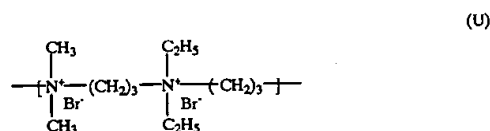
[0061] X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

[0062] Representative polymers of formula (a) include those in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are chosen from methyl and ethyl groups and X<sup>-</sup> is a halogen atom such as a halogen chosen from chlorine, iodine and bromine.

[0063] Further, representative polymers of formula (a) include polymers in which R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub> are methyl groups and n=3, p=6 and X=Cl, such as those of which the molecular weight, determined by gel-permeation chromatography, ranges from 9500 to 9900 and exemplified by formula (W):



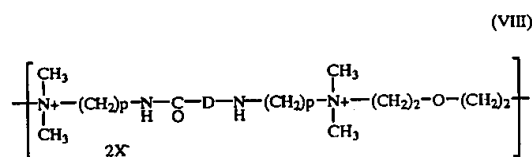
[0064] Other embodiments of the invention use polymers of formula (a) wherein R<sub>1</sub> and R<sub>2</sub> are methyl groups, R<sub>3</sub> and R<sub>4</sub> are ethyl groups and n=p=3 and X=Br, such as those of which the molecular weight, determined by gel-permeation chromatography, is approximately 1200 and exemplified by formula (U):



[0065] Said quaternary polyammoniums of formula (a) are prepared as described in French Patent 2,270,846, the disclosure of which is incorporated by reference herein.

[0066] The at least one other particular quaternary polyammonium polymer according to the invention can also be chosen from:

[0067] (ii) polyquaternary ammonium polymers comprising repeating units of formula (VIII):



[0068] wherein:

[0069] p is an integer ranging from 1 to 6,

[0070] D is chosen from direct bonds and  $\text{---}(\text{CH}_2)_r\text{---}$ ,  $\text{CO---}$  groups, wherein r is a number equal to 4 or 7, and

[0071] X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

[0072] Representative polyquaternary ammonium polymers comprising repeating units of formula (VIII) include those which have a molecular mass, measured by Carbon-13 NMR, of less than 100,000.

[0073] Among the polymers of formula (VIII) that may be mentioned include those for which:

[0074] a) D is a group  $\text{---}(\text{CH}_2)_4\text{---CO---}$ , X<sup>-</sup> is a chlorine atom, the molecular mass, measured by Carbon-13 NMR (<sup>13</sup>C NMR), is about 5600; for example,

(VII)

a polymer of this type is provided by the company Miranol under the name Mirapol-AD1,

[0075] b) D is a group  $-(CH_2)_7-CO-$ ,  $X^-$  is a chlorine atom, the molecular mass, measured by Carbon-13 NMR ( $^{13}C$  NMR), is about 8100; for example, a polymer of this type is provided by the company Miranol under the name Mirapol-AZ1,

[0076] c) D is a direct bond,  $X^-$  is a chlorine atom, the molecular mass, measured by Carbon-13 NMR ( $^{13}C$  NMR), is about 25,500; for example, a polymer of this type is sold by the company Miranol under the name Mirapol-A15,

[0077] d) formula (VII) is a "Block Copolymer" comprising repeating units of each of the polymers described in paragraphs a) and c), which is for example provided by the company Miranol under the names Mirapol-9 ( $^{13}C$  NMR molecular mass about 7800), Mirapol-175 ( $^{13}C$  NMR molecular mass about 8000), Mirapol-95 ( $^{13}C$  NMR molecular mass about 12500).

[0078] Another embodiment according to the invention is one in which in the polymer of formula (VIII) D is a direct bond,  $X^-$  is a chlorine atom, the molecular mass, measured by Carbon-13 NMR ( $^{13}C$  NMR), is about 25500.

[0079] Said quaternary polyammoniums of formula (VIII) may be prepared according to the methods described in U.S. Pat. Nos. 4,157,388, 4,390,689, 4,702,906, 4,719,282, the disclosures of which are incorporated by reference herein.

[0080] The at least one dialkyldiallylammonium cyclohomopolymer can be present in an amount ranging for example from 0.05% to 5% by weight relative to the total weight of the invention, such as for example from 0.1% to 3% by weight relative to the total weight of the invention.

[0081] The at least one quaternary polyammonium with units of formula (a) or (VIII) can be present in an amount ranging for example from 0.05% to 10% by weight relative to the total weight of the composition, such as for example from 0.2% to 5% by weight relative to the total weight of the composition.

[0082] In the composition, the weight ratio of the at least one quaternary polyammonium with units of formula (a) or (VIII) to the dialkyldiallylammonium cyclohomopolymer of formula (VI) ranges for example from 0.1:1 to 50:1, such as from 1:1 to 10:1.

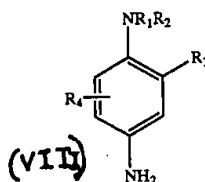
[0083] Oxidation Dyes

[0084] The at least one oxidation dye which can be used according to the present invention is chosen from oxidation bases, and oxidation couplers. In one embodiment, the compositions can comprise at least one oxidation base.

[0085] The oxidation bases usable in the context of the present invention are chosen from those conventionally known as oxidation dyes. Representative oxidation dyes include ortho- and para-phenylenediamines, double bases, ortho- and para-aminophenols and heterocyclic bases as well as their addition salts with an acid.

[0086] For example, the following oxidation bases may be used:

[0087] (I) para-phenylenediamines chosen from compounds of formula (I), and their acid addition salts:



[0088] wherein:

[0089]  $R_1$  is chosen from hydrogen,  $C_1$ - $C_4$  alkyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, polyhydroxy( $C_1$ - $C_4$  alkyl) groups, ( $C_1$ - $C_4$ )alkoxy( $C_1$ - $C_4$ )alkyl groups, phenyl groups, 4'-aminophenyl groups, and  $C_1$ - $C_4$  alkyl groups substituted with at least one group chosen from nitrogen-containing groups,

[0090]  $R_2$  is chosen from hydrogen,  $C_1$ - $C_4$  alkyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, polyhydroxy( $C_1$ - $C_4$  alkyl) groups, ( $C_1$ - $C_4$ )alkoxy( $C_1$ - $C_4$ )alkyl groups, and  $C_1$ - $C_4$  alkyl groups substituted with a nitrogen-containing group;

[0091]  $R_1$  and  $R_2$  may also form, together with the nitrogen atom to which they are bonded, a 5- or 6-membered nitrogen-containing heterocycle ring, optionally substituted with at least one group chosen from alkyl groups, hydroxyl groups and ureido groups;

[0092]  $R_3$  is chosen from hydrogen, halogens, such as chlorine,  $C_1$ - $C_4$  alkyl groups, sulfo groups, carboxyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, hydroxy( $C_1$ - $C_4$  alkoxy) groups, acetaminato( $C_1$ - $C_4$  alkoxy) groups, mesylamino( $C_1$ - $C_4$  alkoxy) groups, and carbamoylamino( $C_1$ - $C_4$  alkoxy) groups;

[0093]  $R_4$  is chosen from hydrogen, halogens, and  $C_1$ - $C_4$  alkyl groups.

[0094] Suitable nitrogen-containing groups of formula (I) above may, for example, be chosen from amino, ( $C_1$ - $C_4$ ) monoalkylamino, ( $C_1$ - $C_4$ ) dialkylamino, ( $C_1$ - $C_4$ ) trialkylamino, monohydroxy( $C_1$ - $C_4$ ) alkylamino, imidazolium, and ammonium groups.

[0095] Representative para-phenylenediamines of formula (I) above which may be used include para-phenylenediamine, para-tolylenediamine, 2-chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis( $\beta$ -hydroxyethyl)-para-phenylenediamine, 4-N,N-bis( $\beta$ -hydroxyethyl)amino-2-methylaniline, 4-N,N-bis( $\beta$ -hydroxyethyl)amino-2-chloroaniline, 2 $\beta$ -hydroxyethyl-para-phenylenediamine, 2-fluoro-para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-( $\beta$ -hydroxypropyl)-para-phenylenediamine, 2-hydroxymethyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine, N,N-(ethyl- $\beta$ -hydroxyethyl)-para-phenylenediamine, N-( $\beta$ ,  $\gamma$ -dihydroxypropyl)-para-phenylenediamine, N-(4'-ami-

(I)

2,5-dimethyl-para-phenylenediamine  
N,N-bis( $\beta$ -hydroxyethyl)-para-phenylenediamine  
N-( $\beta$ -hydroxypropyl)-para-phenylenediamine

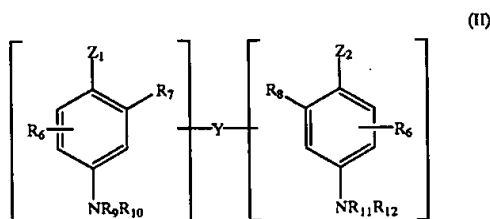
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nophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2-β-hydroxyethyloxy-para-phenylenediamine, 2-β-acetylaminoethyloxy-para-phenylenediamine, N-(β-methoxyethyl)-para-phenylenediamine, 2-methyl-1-N-β-hydroxyethyl-para-phenylenediamine and their acid addition salts.

[0096] In other embodiments of the present invention, para-phenylenediamines of formula (I) above can, for example, be chosen from para-phenylenediamine, para-tolylenediamine, 2-isopropyl-para-phenylenediamine, 2-β-hydroxyethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, N,N-bis(β-hydroxyethyl)-para-phenylenediamine, 2-chloro-para-phenylenediamine, and their acid addition salts.

[0097] According to the invention, "double bases" is understood to mean the compounds comprising at least two aromatic rings on which at least one functional group chosen from amino groups and hydroxyl groups are carried.

[0098] (II) double bases chosen from compounds comprising at least two aromatic rings substituted with at least one group chosen from amino and hydroxyl groups. Such double bases may be chosen from compounds of formula (II), and their acid addition salts:



[0099] wherein:

[0100]  $Z_1$  and  $Z_2$ , which may be identical or different, are each chosen from hydroxyl groups, and  $-NH_2$  groups, optionally substituted with a group chosen from  $C_1$ - $C_4$  alkyl groups, and linkers Y;

[0101] linker Y is chosen from linear and branched, divalent alkylene groups comprising from 1 to 14 carbon atoms, optionally interrupted by, or optionally terminating with, at least one entity chosen from nitrogen-containing groups and heteroatoms such as oxygen, sulfur, and nitrogen, and optionally substituted with at least one group chosen from hydroxyl groups, and  $C_1$ - $C_6$  alkoxy groups;

[0102]  $R_5$  and  $R_6$ , which may be identical or different, are each chosen from hydrogen, halogens,  $C_1$ - $C_4$  alkyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, polyhydroxy( $C_1$ - $C_4$  alkyl) groups, amino( $C_1$ - $C_4$  alkyl) groups, and linkers Y;

[0103]  $R_7$ ,  $R_8$ ,  $R_9$ ,  $R_{10}$ ,  $R_{11}$ , and  $R_{12}$ , which may be identical or different, are each chosen from hydrogen, linkers Y, and  $C_1$ - $C_4$  alkyl groups;

[0104] provided that said compounds of formula (II) comprise only one linker Y per molecule.

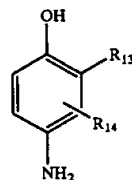
[0105] Suitable nitrogen-containing groups of formula (II) include mono( $C_1$ - $C_4$ )alkylamino, ( $C_1$ - $C_4$ )dialkylamino, ( $C_1$ - $C_4$ )trialkylamino, monohydroxy( $C_1$ - $C_4$ )alkylamino, imidazolinium and ammonium groups.

[0106] Representative double bases of formula (II) include  $N,N'$ -bis(β-hydroxyethyl)- $N,N'$ -bis(4'-aminophenyl)-1,3-diaminopropanol;  $N,N'$ -bis(β-hydroxyethyl)- $N,N'$ -bis(4'-aminophenyl)ethylenediamine,  $N,N'$ -bis(4-aminophenyl)tetramethylenediamine,  $N,N'$ -bis(β-hydroxyethyl)- $N,N'$ -bis(4-aminophenyl)tetramethylenediamine,  $N,N'$ -bis(4-methylaminophenyl)tetramethylenediamine,  $N,N'$ -bis(ethyl)- $N,N'$ -bis(4'-amino-3'-methylphenyl)ethylenediamine, 1,8-bis(2,5-diaminophenoxy)-3,5-dioxaoctane, and their acid addition salts.

[0107] In another embodiment of the invention, the double bases of formula (II) may be chosen from  $N,N'$ -bis(β-hydroxyethyl)- $N,N'$ -bis(4'-aminophenyl)-1,3-diaminopropanol, 1,8-bis(2,5-diaminophenoxy)-3,5-dioxaoctane, and their acid addition salts.

[0108] (III) para-aminophenols chosen from compounds of formula (III), and their acid addition salts:

(III)



[0109] wherein:

[0110]  $R_{13}$  is chosen from hydrogen, halogens, such as fluorine,  $C_1$ - $C_4$  alkyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, ( $C_1$ - $C_4$ )alkoxy( $C_1$ - $C_4$  alkyl) groups, amino( $C_1$ - $C_4$  alkyl), and hydroxy( $C_1$ - $C_4$ )alkylamino( $C_1$ - $C_4$  alkyl) groups;

[0111]  $R_{14}$  is chosen from hydrogen, halogens, such as fluorine,  $C_1$ - $C_4$  alkyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, polyhydroxy( $C_2$ - $C_4$  alkyl) groups, amino( $C_1$ - $C_4$  alkyl) groups, cyano( $C_1$ - $C_4$  alkyl) groups, and ( $C_1$ - $C_4$ )alkoxy( $C_1$ - $C_4$ )alkyl groups.

[0112] Representative para-aminophenols of formula (III) above include para-aminophenol, 4-amino-3-methylphenol, 4-amino-3-fluorophenol, 4-amino-3-hydroxymethylphenol, 4-amino-2-methylphenol, 4-amino-2-hydroxymethylphenol, 4-amino-2-methoxymethylphenol, 4-amino-2-aminomethylphenol, 4-amino-2-(β-hydroxyethylaminomethyl)phenol, and their acid addition salts.

[0113] (IV) ortho-aminophenols chosen, for example, from 2-aminophenol, 2-amino-1-hydroxy-5-methylbenzene, 2-amino-1-hydroxy-6-methylbenzene, 5-acetamido-2-aminophenol, and their acid addition salts.

[0114] (V) heterocyclic bases chosen, for example, from pyridine derivatives, pyrimidine derivatives, pyrazole derivatives, pyrazolo-pyrimidine derivatives, and their acid addition salts.

2-β-hydroxyethyloxy-para-phenylenediamine

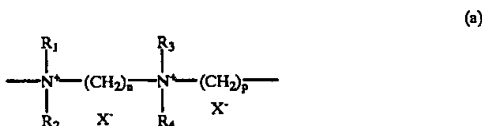


$R_{10}$  and  $R_{11}$ , together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;

$Y^-$  is an anion; and

(II) at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



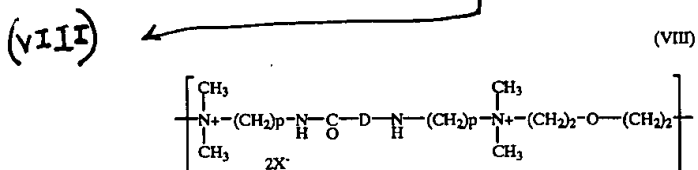
wherein:

$R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

$n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (viii):



wherein:

$p$  is an integer ranging from 1 to 6,

$D$  is chosen from direct bonds and  $-(CH_2)_r-CO-$  groups, wherein  $r$  is a number equal to 4 or 7, and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids, and

(b) developing the color with the aid of at least one oxidizing composition (B) comprising at least one oxidizing agent, wherein said at least one oxidizing composition (B) is combined at the time of use with said at least one dyeing composition (A) or said at least one oxidizing composition (B) is applied sequentially to said at least one dyeing composition (A) without intermediate rinsing.

56. A method according to claim 55, wherein said keratin fibers are chosen from human keratin fibers.

57. A method according to claim 56, wherein said human keratin fibers are human hair.

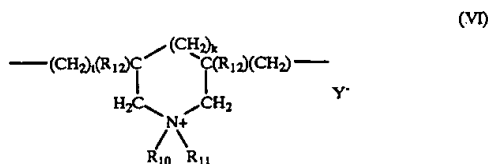
58. A method for oxidation dyeing keratin fibers comprising:

(a) applying to said keratin fibers at least one dyeing composition (A) comprising, in a dyeing medium:

at least one oxidation dye, and

a combination comprising:

(I) at least one cyclohomopolymer of dialkyldiallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):



wherein:

$k$  and  $t$ , which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of  $k+t$  is equal to 1;

$R_{12}$ , which may be identical or different, are each chosen from hydrogen atoms and methyl groups;

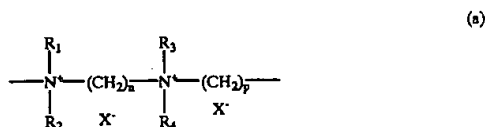
$R_{10}$  and  $R_{11}$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and  $C_1$ - $C_4$  amidoalkyl groups;

$R_{10}$  and  $R_{11}$ , together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;

$Y^-$  is an anion; and

(II) at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



wherein:

$R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

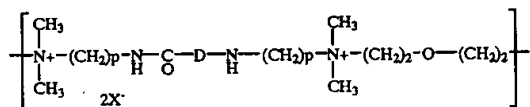
$n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

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(VII)

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VII):



wherein:

p is an integer ranging from 1 to 6,

D is chosen from direct bonds and  $-(\text{CH}_2)_r-\text{CO}-$  groups, wherein r is a number equal to 4 or 7, andX<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids, and

(b) developing the color with the aid of at least one oxidizing composition (B) comprising:

at least one oxidizing agent, and

a combination comprising at least one cyclohomopolymer of dialkyldiallylammonium as defined above and at least one other quaternary polyammonium as defined above,

wherein said at least one oxidizing composition (B) is combined at the time of use with said at least one dyeing composition (A) or said at least one oxidizing composition (B) is applied sequentially to said at least one dyeing composition (A) without intermediate rinsing.

59. A method according to claim 58, wherein said keratin fibers are chosen from human keratin fibers.

60. A method according to claim 59, wherein said human keratin fibers are human hair.

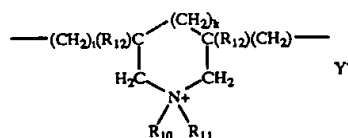
61. A method for oxidation dyeing keratin fibers comprising:

applying to said keratin fibers at least one dyeing composition (A) comprising, in a dyeing medium, at least one oxidation dye,

developing the color with the aid of at least one oxidizing composition (B) comprising at least one oxidizing agent,

wherein said oxidizing composition (B) comprises a combination comprising:

(I) at least one cyclohomopolymer of dialkyldiallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):



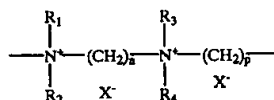
wherein:

k and t, which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of k+t is equal to 1;

R<sub>12</sub>, which may be identical or different, are each chosen from hydrogen atoms and methyl groups;R<sub>10</sub> and R<sub>11</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and C<sub>1</sub>-C<sub>4</sub> amidoalkyl groups;R<sub>10</sub> and R<sub>11</sub>, together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;Y<sup>-</sup> is an anion; and

(II) at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



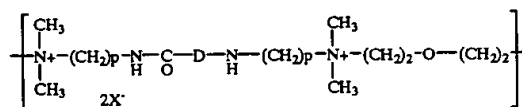
wherein:

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

n and p, which may be identical or different, are each chosen from integers ranging from 2 to 20; and

X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VII):



wherein:

p is an integer ranging from 1 to 6,

D is chosen from direct bonds and  $-(\text{CH}_2)_r-\text{CO}-$  groups, wherein r is a number equal to 4 or 7, andX<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids,

wherein said at least one oxidizing composition (B) is combined at the time of use with said at least one dyeing composition (A) or wherein said at least one oxidizing composition (B) is applied sequentially to said at least one dyeing composition (A) without intermediate rinsing.

(VII)

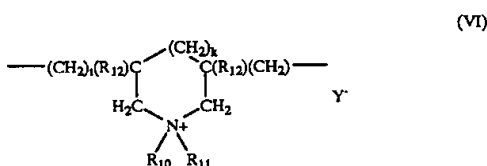
62. A method according to claim 61, wherein said keratin fibers are chosen from human keratin fibers.

63. A method according to claim 62, wherein said human keratin fibers are human hair.

64. A kit for dyeing keratin fibers comprising at least two compartments, wherein:

a first compartment comprises at least one oxidation dye and a combination comprising:

(I) at least one cyclohomopolymer of dialkyldiallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):



wherein:

k and t, which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of k+t is equal to 1;

R<sub>12</sub>, which may be identical or different, are each chosen from hydrogen atoms and methyl groups;

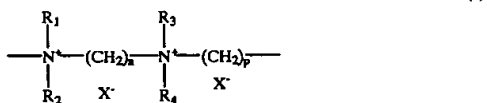
R<sub>10</sub> and R<sub>11</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and C<sub>1</sub>-C<sub>4</sub> amidoalkyl groups;

R<sub>10</sub> and R<sub>11</sub>, together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;

Y<sup>-</sup> is an anion; and

(II) at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



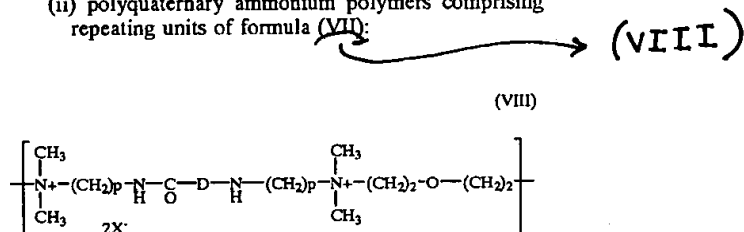
wherein:

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

n and p, which may be identical or different, are each chosen from integers ranging from 2 to 20; and

X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VII):



wherein:

p is an integer ranging from 1 to 6,

D is chosen from direct bonds and  $\text{---}(\text{CH}_2)_r\text{CO}\text{---}$  groups, wherein r is a number equal to 4 or 7, and

X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids, and

a second compartment comprises at least one oxidizing agent.

65. A kit according to claim 64, wherein said keratin fibers are chosen from human keratin fibers.

66. A kit according to claim 65, wherein said human keratin fibers are human hair.

67. A composition according to claim 36, wherein said at least one fatty alcohol is chosen from linear and branched, saturated and unsaturated fatty alcohols.

68. A composition according to claim 1, wherein in said R<sub>10</sub> and R<sub>11</sub> said alkyl radical of said hydroxyalkyl groups comprises from 1 to 5 carbon atoms.

69. A composition according to claim 38, wherein in said R<sub>10</sub> and R<sub>11</sub> said alkyl radical of said hydroxyalkyl groups comprises from 1 to 5 carbon atoms.

70. A composition according to claim 55, wherein in said R<sub>10</sub> and R<sub>11</sub> said alkyl radical of said hydroxyalkyl groups comprises from 1 to 5 carbon atoms.

71. A composition according to claim 58, wherein in said R<sub>10</sub> and R<sub>11</sub> said alkyl radical of said hydroxyalkyl groups comprises from 1 to 5 carbon atoms.

72. A composition according to claim 61, wherein in said R<sub>10</sub> and R<sub>11</sub> said alkyl radical of said hydroxyalkyl groups comprises from 1 to 5 carbon atoms.

73. A composition according to claim 64, wherein in said R<sub>10</sub> and R<sub>11</sub> said alkyl radical of said hydroxyalkyl groups comprises from 1 to 5 carbon atoms.

74. A method for oxidation dyeing keratin fibers comprising:

(a) applying to said keratin fibers at least one dyeing composition (A) comprising, in a dyeing medium:

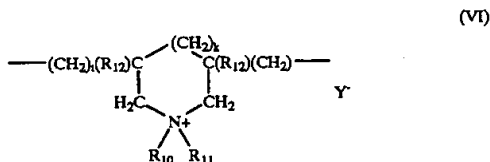
at least one oxidation dye, and

(b) developing the color with the aid of at least one oxidizing composition (B) comprising at least one oxidizing agent, wherein said at least one oxidizing composition (B) is combined at the time of use with said at least one dyeing composition (A) or said at least one oxidizing composition (B) is applied sequentially to said at least one dyeing composition (A) without intermediate rinsing, wherein:

(I) said at least one dyeing composition (A) comprises:

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at least one cyclohomopolymer of dialkyldiallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):



wherein:

k and t, which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of k+t is equal to 1;

R<sub>12</sub>, which may be identical or different, are each chosen from hydrogen atoms and methyl groups;

R<sub>10</sub> and R<sub>11</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and C<sub>1</sub>-C<sub>4</sub> amidoalkyl groups;

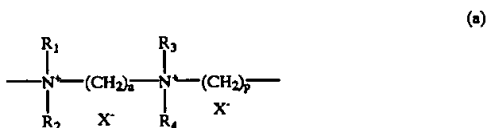
R<sub>10</sub> and R<sub>11</sub>, together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;

Y<sup>-</sup> is an anion; and wherein:

(II) said at least one oxidizing composition (B) comprises:

at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



wherein:

R<sub>1</sub>, R<sub>2</sub>, R<sub>3</sub> and R<sub>4</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

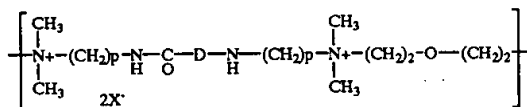
n and p, which may be identical or different, are each chosen from integers ranging from 2 to 20; and

X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VII):

(VII)

(VIII)



wherein:

p is an integer ranging from 1 to 6,

D is chosen from direct bonds and  $\text{---}(\text{CH}_2)_r\text{---CO---}$  groups, wherein r is a number equal to 4 or 7, and

X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

75. A method according to claim 74, wherein said keratin fibers are chosen from human keratin fibers.

76. A method according to claim 75, wherein said human keratin fibers are human hair.

77. A method for oxidation dyeing keratin fibers comprising:

(a) applying to said keratin fibers at least one dyeing composition (A) comprising, in a dyeing medium:

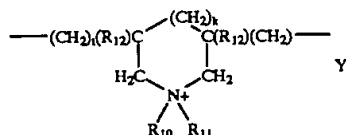
at least one oxidation dye, and

(b) developing the color with the aid of at least one oxidizing composition (B) comprising at least one oxidizing agent, wherein said at least one oxidizing composition (B) is combined at the time of use with said at least one dyeing composition (A) or said at least one oxidizing composition (B) is applied sequentially to said at least one dyeing composition (A) without intermediate rinsing, wherein:

(I) said at least one oxidizing composition (B) comprises:

at least one cyclohomopolymer of dialkyldiallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):

(VI)



wherein:

k and t, which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of k+t is equal to 1;

R<sub>12</sub>, which may be identical or different, are each chosen from hydrogen atoms and methyl groups;

R<sub>10</sub> and R<sub>11</sub>, which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and C<sub>1</sub>-C<sub>4</sub> amidoalkyl groups;

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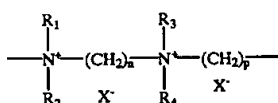
$R_{10}$  and  $R_{11}$ , together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;

$Y^-$  is an anion; and wherein:

(II) said at least one dyeing composition (A) comprises:

at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



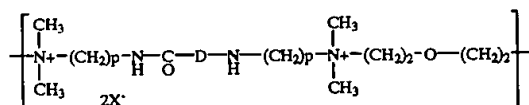
wherein:

$R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

$n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VII):



wherein:

$p$  is an integer ranging from 1 to 6,

$D$  is chosen from direct bonds and  $-(CH_2)_r-CO-$  groups, wherein  $r$  is a number equal to 4 or 7, and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

78. A method according to claim 77, wherein said keratin fibers are chosen from human keratin fibers.

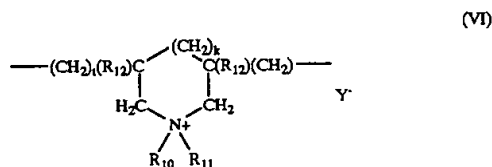
79. A method according to claim 78, wherein said human keratin fibers are human hair.

80. A kit for dyeing keratin fibers comprising at least two compartments, wherein:

a first compartment comprises at least one oxidation dye and

a second compartment comprises at least one oxidizing agent and a combination comprising:

(I) at least one cyclohomopolymer of dialkylallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):



wherein:

$k$  and  $l$ , which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of  $k+l$  is equal to 1;

$R_{12}$ , which may be identical or different, are each chosen from hydrogen atoms and methyl groups;

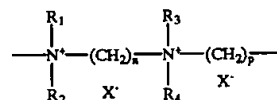
$R_{10}$  and  $R_{11}$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and  $C_1$ - $C_4$  amidoalkyl groups;

$R_{10}$  and  $R_{11}$ , together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;

$Y^-$  is an anion; and

(II) at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



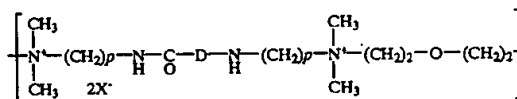
wherein:

$R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

$n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VIII):



wherein:

$p$  is an integer ranging from 1 to 6,

D is chosen from direct bonds and  $-(CH_2)_r-CO-$  groups, wherein r is a number equal to 4 or 7, and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

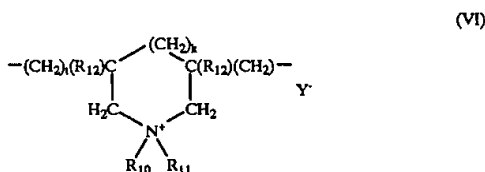
81. A kit according to claim 80, wherein said keratin fibers are chosen from human keratin fibers.

82. A kit according to claim 81, wherein said human keratin fibers are human hair.

83. A kit for dyeing keratin fibers comprising at least two compartments, wherein:

a first compartment comprises at least one oxidation dye and a combination comprising:

(I) at least one cyclohomopolymer of dialkyldiallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):



wherein:

k and t, which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of k+t is equal to 1;

$R_{12}$ , which may be identical or different, are each chosen from hydrogen atoms and methyl groups;

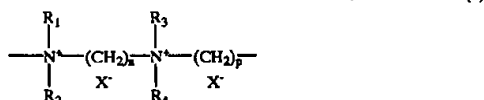
$R_{10}$  and  $R_{11}$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and  $C_1$ - $C_4$  amidoalkyl groups;

$R_{10}$  and  $R_{11}$ , together with the nitrogen atom to which they are commonly bonded, may additionally form at least one heterocyclic group;

$Y^-$  is an anion; and

(II) at least one quaternary polyammonium polymer chosen from:

(i) polymers comprising repeating units of formula (a):



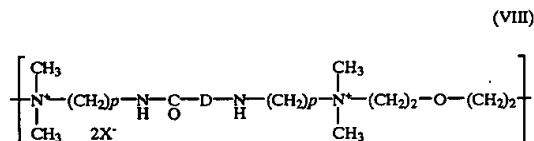
wherein:

$R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

n and p, which may be identical or different, are each chosen from integers ranging from 2 to 20; and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VIII):



wherein:

p is an integer ranging from 1 to 6,

D is chosen from direct bonds and  $-(CH_2)_r-CO-$  groups, wherein r is a number equal to 4 or 7, and

$X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids, and

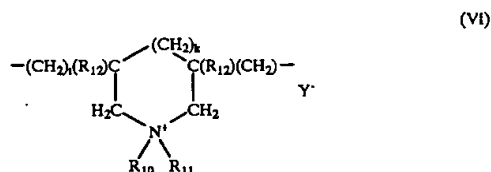
a second compartment comprises at least one oxidizing agent and a combination comprising at least one cyclohomopolymer of dialkyldiallylammonium as defined above and at least one other quaternary polyammonium polymer as defined above.

84. A kit according to claim 83, wherein said keratin fibers are chosen from human keratin fibers.

85. A kit according to claim 84, wherein said human keratin fibers are human hair.

86. A kit for dyeing keratin fibers comprising at least two compartments, wherein:

a first compartment comprises at least one oxidation dye and at least one cyclohomopolymer of dialkyldiallylammonium comprising, as a constituent of the chain, at least one unit of structure (VI):



wherein:

k and t, which may be identical or different, are each chosen from 0 and 1, with the proviso that the sum of k+t is equal to 1;

$R_{12}$ , which may be identical or different, are each chosen from hydrogen atoms and methyl groups;

$R_{10}$  and  $R_{11}$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 22 carbon atoms, hydroxyalkyl groups, and  $C_1$ - $C_4$  amidoalkyl groups;

wherein:

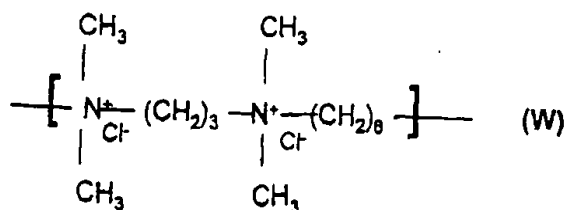
-  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

-  $n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

-  $X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

Representative polymers of formula (a) include those in which  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  are chosen from methyl and ethyl groups and  $X^-$  is a halogen atom such as a halogen chosen from chlorine, iodine and bromine.

Further, representative polymers of formula (a) include polymers in which  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  are methyl groups and  $n = 3$ ,  $p = 6$  and  $X = Cl$ , such as those of which the molecular weight, determined by gel-permeation chromatography, ranges from 9500 to 9900 and exemplified by formula (W):



wherein:

- p is an integer ranging from 1 to 6,
- D is chosen from direct bonds and  $-(CH_2)_r-CO-$  groups, wherein r is a number equal to 4 or 7, and
- $X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

Representative polyquaternary ammonium polymers comprising repeating units of formula (VIII) include those which have a molecular mass, measured by Carbon-13 NMR, of less than 100,000.

Among the polymers of formula (VIII) that may be mentioned include those for which:

- a) D is a group  $-(CH_2)_4-CO-$ ,  $X^-$  is a chlorine atom, the molecular mass, measured by Carbon-13 NMR ( $^{13}C$  NMR), is about 5600; for example, a polymer of this type is provided by the company Miranol under the name Mirapol-AD1,
- b) D is a group  $-(CH_2)_7-CO-$ ,  $X^-$  is a chlorine atom, the molecular mass, measured by Carbon-13 NMR ( $^{13}C$  NMR), is about 8100; for example, a polymer of this type is provided by the company Miranol under the name Mirapol-AZ1,
- c) D is a direct bond,  $X^-$  is a chlorine atom, the molecular mass, measured by Carbon-13 NMR ( $^{13}C$  NMR), is about 25,500; for example, a polymer of this type is sold by the company Miranol under the name Mirapol-A15,
- d) formula (VIII) is a "Block Copolymer" comprising repeating units of each of the polymers described in paragraphs a) and c), which is for example provided by the company Miranol



- $R_2$  is chosen from hydrogen,  $C_1$ - $C_4$  alkyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, polyhydroxy( $C_2$ - $C_4$  alkyl) groups, ( $C_1$ - $C_4$ )alkoxy( $C_1$ - $C_4$ )alkyl groups, and  $C_1$ - $C_4$  alkyl groups substituted with a nitrogen-containing group;
- $R_1$  and  $R_2$  may also form, together with the nitrogen atom to which they are bonded, a 5- or 6- membered nitrogen-containing heterocycle ring, optionally substituted with at least one group chosen from alkyl groups, hydroxyl groups and ureido groups;
- $R_3$  is chosen from hydrogen, halogens, such as chlorine,  $C_1$ - $C_4$  alkyl groups, sulfo groups, carboxyl groups, monohydroxy( $C_1$ - $C_4$  alkyl) groups, hydroxy( $C_1$ - $C_4$  alkoxy) groups, acetylamino( $C_1$ - $C_4$  alkoxy) groups, mesylamino( $C_1$ - $C_4$  alkoxy) groups, and carbamoylamino( $C_1$ - $C_4$  alkoxy) groups;
- $R_4$  is chosen from hydrogen, halogens, and  $C_1$ - $C_4$  alkyl groups.

Suitable nitrogen-containing groups of formula (I) above may, for example, be chosen from amino, ( $C_1$ - $C_4$ ) monoalkylamino, ( $C_1$ - $C_4$ )dialkylamino, ( $C_1$ - $C_4$ )trialkylamino, monohydroxy( $C_1$ - $C_4$ )alkylamino, imidazolinium, and ammonium groups.

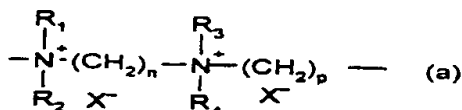
Representative para-phenylenediamines of formula (I) above which may be used include para-phenylenediamine, para-tolylenediamine, 2-chloro-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,5-dimethyl-para-phenylenediamine, N,N-dimethyl-para-phenylenediamine, N,N-diethyl-para-phenylenediamine, N,N-dipropyl-para-phenylenediamine, 4-amino-N,N-diethyl-3-methylaniline, N,N-bis( $\beta$ -hydroxyethyl)-para-phenylenediamine, 4-N,N-bis( $\beta$ -hydroxyethyl)amino-2-methylaniline, 4-N,N-bis( $\beta$ -hydroxyethyl)amino-2-chloroaniline, 2- $\beta$ -hydroxyethyl-para-phenylenediamine, 2-fluoro-

para-phenylenediamine, 2-isopropyl-para-phenylenediamine, N-( $\beta$ -hydroxypropyl)-para-phenylenediamine, 2-hydroxymethyl-para-phenylenediamine, N,N-dimethyl-3-methyl-para-phenylenediamine, N,N-(ethyl- $\beta$ -hydroxyethyl)-para-phenylenediamine, N-( $\beta$ , $\gamma$ -dihydroxypropyl)-para-phenylenediamine, N-(4'-aminophenyl)-para-phenylenediamine, N-phenyl-para-phenylenediamine, 2- $\beta$ -hydroxyethyloxy-para-phenylenediamine, 2- $\beta$ -acetylaminoethyloxy-para-phenylenediamine, N-( $\beta$ -methoxyethyl)-para-phenylenediamine, 2-methyl-1-N- $\beta$ -hydroxyethyl-para-phenylenediamine and their acid addition salts.

In other embodiments of the present invention, para-phenylenediamines of formula (I) above can, for example, be chosen from para-phenylenediamine, para-tolylenediamine, 2-isopropyl-para-phenylenediamine, 2- $\beta$ -hydroxyethyl-para-phenylenediamine, 2- $\beta$ -hydroxyethyloxy-para-phenylenediamine, 2,6-dimethyl-para-phenylenediamine, 2,6-diethyl-para-phenylenediamine, 2,3-dimethyl-para-phenylenediamine, N,N-bis( $\beta$ -hydroxyethyl)-para-phenylenediamine, 2-chloro-para-phenylenediamine, and their acid addition salts.

According to the invention, "double bases" is understood to mean the compounds comprising at least two aromatic rings on which at least one functional group chosen from amino groups and hydroxyl groups are carried.

- (II) double bases chosen from compounds comprising at least two aromatic rings substituted with at least one group chosen from amino and hydroxyl groups. Such double bases may be chosen from compounds of formula (II), and their acid addition salts:



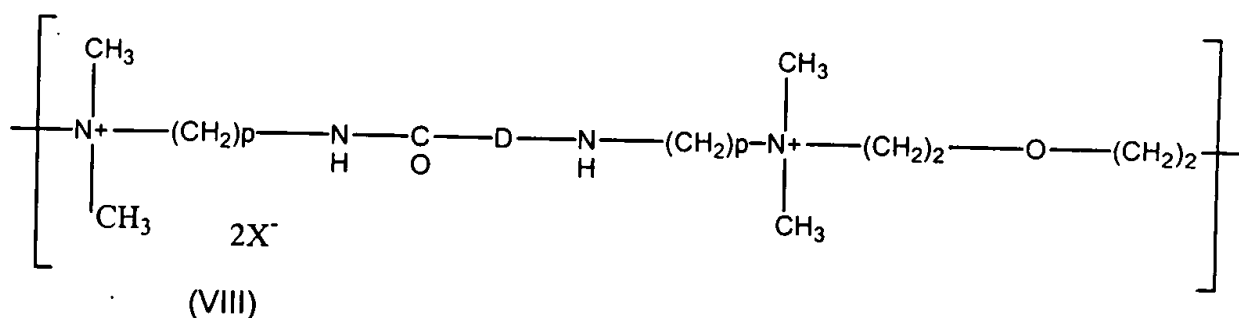
wherein:

-  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

-  $n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

-  $X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VIII):



wherein:

-  $p$  is an integer ranging from 1 to 6,

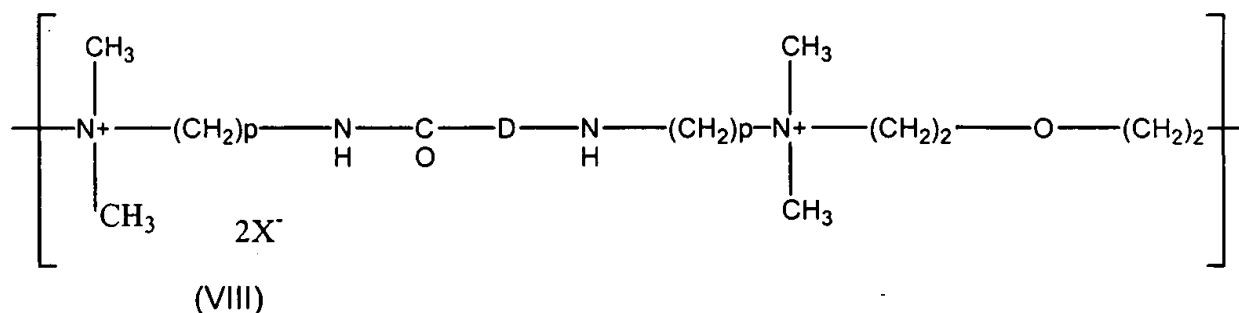
wherein:

-  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

-  $n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

-  $X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VIII):



wherein:

-  $p$  is an integer ranging from 1 to 6,

-  $D$  is chosen from direct bonds and  $-(\text{CH}_2)_r-\text{CO}-$  groups, wherein  $r$  is a number equal to 4 or 7, and

-  $X^-$  is an anion chosen from anions derived from inorganic acids and anions derived

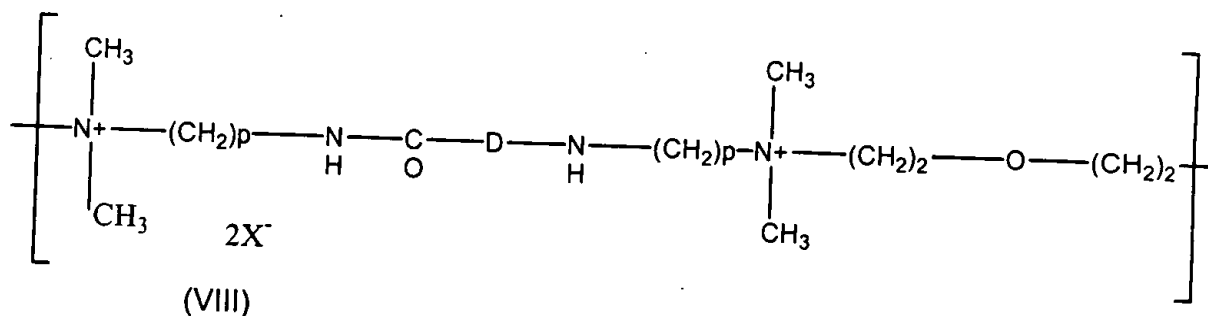
wherein:

-  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$ , which may be identical or different, are each chosen from alkyl groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

-  $n$  and  $p$ , which may be identical or different, are each chosen from integers ranging from 2 to 20; and

-  $X^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VIII):



wherein:

-  $p$  is an integer ranging from 1 to 6,

-  $D$  is chosen from direct bonds and  $-(\text{CH}_2)_r-\text{CO}-$  groups, wherein  $r$  is a number equal to 4 or 7, and

-  $X^-$  is an anion chosen from anions derived from inorganic acids and anions derived

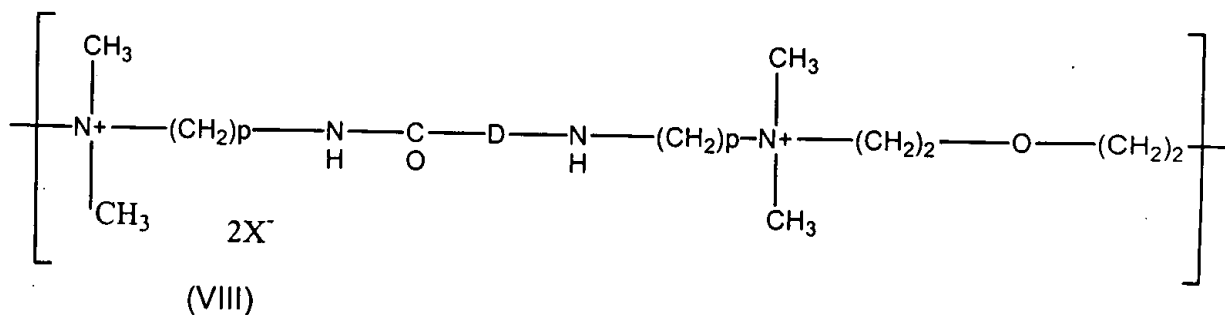
groups comprising from 1 to 4 carbon atoms and hydroxyalkyl groups comprising from 1 to 4 carbon atoms;

- n and p, which may be identical or different, are each chosen from integers ranging from 2 to 20; and

- X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula

(VIII):



wherein:

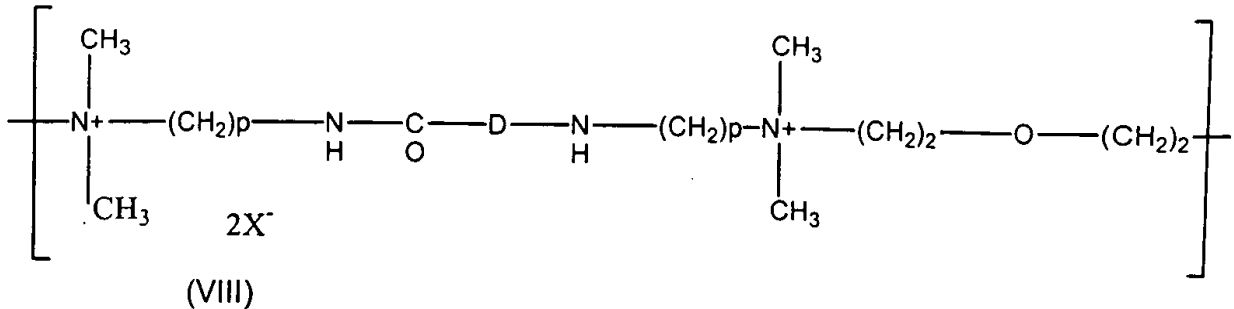
- p is an integer ranging from 1 to 6,

- D is chosen from direct bonds and  $-(\text{CH}_2)_r-\text{CO}-$  groups, wherein r is a number equal to 4 or 7, and

- X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids, and

- a second compartment comprises at least one oxidizing agent.

formula (VIII):



wherein:

- p is an integer ranging from 1 to 6,
- D is chosen from direct bonds and  $-(\text{CH}_2)_r\text{-CO-}$  groups, wherein r is a number equal to 4 or 7, and
- $\text{X}^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

75. A method according to claim 74, wherein said keratin fibers are chosen from human keratin fibers.

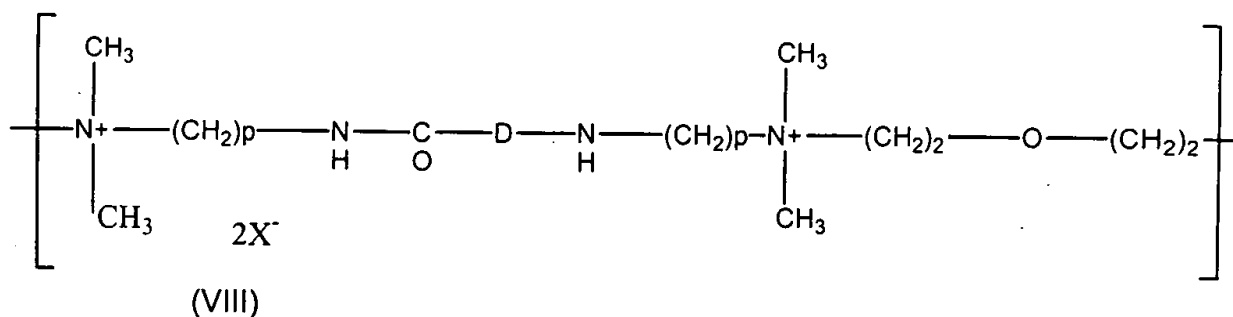
76. A method according to claim 75, wherein said human keratin fibers are human hair.

77. A method for oxidation dyeing keratin fibers comprising:

(a) applying to said keratin fibers at least one dyeing composition (A) comprising, in a dyeing medium:

- at least one oxidation dye, and

formula (VIII):



wherein:

- p is an integer ranging from 1 to 6,
- D is chosen from direct bonds and  $-(\text{CH}_2)_r\text{-CO-}$  groups, wherein r is a number equal to 4 or 7, and
- $\text{X}^-$  is an anion chosen from anions derived from inorganic acids and anions derived from organic acids.

78. A method according to claim 77, wherein said keratin fibers are chosen from human keratin fibers.

79. A method according to claim 78, wherein said human keratin fibers are human hair.

80. A kit for dyeing keratin fibers comprising at least two compartments, wherein:

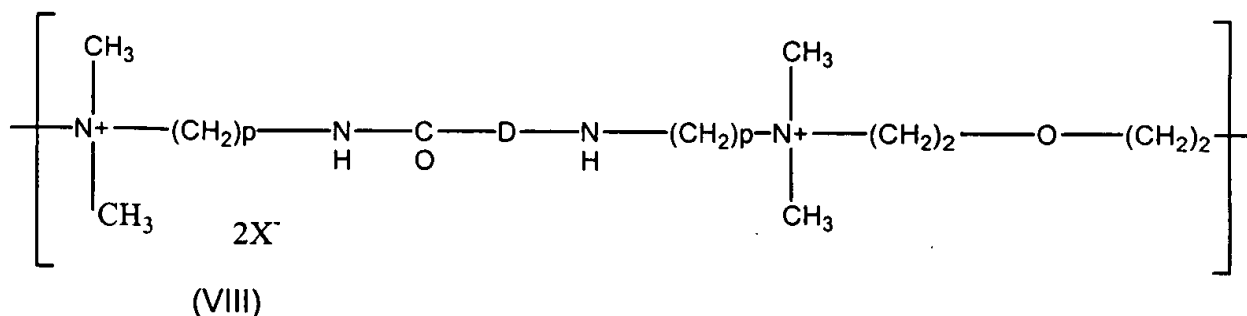
- a first compartment comprises at least one oxidation dye and
- a second compartment comprises at least one oxidizing agent and a combination comprising:



from 2 to 20; and

- X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids; and

(ii) polyquaternary ammonium polymers comprising repeating units of formula (VIII):



wherein:

- p is an integer ranging from 1 to 6,
- D is chosen from direct bonds and  $-(\text{CH}_2)_r-\text{CO}-$  groups, wherein r is a number equal to 4 or 7, and
- X<sup>-</sup> is an anion chosen from anions derived from inorganic acids and anions derived from organic acids, and
- a second compartment comprises at least one oxidizing agent and a combination comprising at least one cyclohomopolymer of dialkyldiallylammonium as defined above and at least one other quaternary polyammonium polymer as defined above.

84. A kit according to claim 83, wherein said keratin fibers are chosen from